PAX®2C

1/8 DIN Temperature/Process PID Profile Controller w/FlexBus™ Capability

Installation Guide

c UL US LISTED
3RSD
PROCESS CONTROL EQUIPMENT

CE

See the Red Lion website at www.redlion.net or the enclosed USB thumbdrive for a complete user manual

SPECIFICATIONS

POWER:
AC Power: 40 to 250 VAC, 50/60 Hz, 20 VA
DC Power: 21.6 to 250 VDC, 8 W
Isolation: 2300 Vrms for 1 min. to all inputs and outputs.

INPUT CAPABILITIES:
Current Input Ranges:
± 250 µADC ± 2.5 mADC ± 25 mADC
± 250 mADC ± 2 ADC

Voltage Input Ranges:
± 250 mVDC ± 2.0 VDC ± 10 VDC
± 25 VDC ± 100 VDC ± 200 VDC

Thermocouple Inputs:
Types: T, E, J, K, R, S, B, N, C (W5/W26)
Max Continuous Overvoltage: 30 V

RTD Inputs:
Type: 3 or 4 wire, 2 wire can be compensated for lead wire resistance
Excitation current: 100 ohm range: 136.5 µA ±10%
10 ohm range: 2.05 mA ±10%
Max. continuous overload: 30 VDC
Input Type:

100 ohm Pt alpha = .00385	100 ohm Pt alpha = .00392
120 ohm Nickel alpha = .00672	10 ohm Copper alpha = .00427

Resistance Inputs:
Max. continuous overload: 30 VDC

INPUT RANGE	COMPLIANCE
100 ohm	0.175 V
999 ohm	1.75 V
9999 ohm	17.5 V

EXCITATION POWER: Jumper selectable
Transmitter Power: +18 VDC, ± 5% @ 50 mA max.
Reference Voltage: + 2 VDC, ± 2%
Compliance: 1KΩ load min (2 mA max)
Temperature Coefficient: 40 ppm/ºC max.
Reference Current: 1.05 mADC, ± 2%
Compliance: 10 KΩ load max.

USER INPUTS: Two programmable user inputs
Max. Continuous Input: 30 VDC
Isolation To Sensor Input Common: Not isolated.

ENVIRONMENTAL CONDITIONS:
Operating Temperature Range: 0 to 50 °C
Storage Temperature Range: -40 to 60 °C
Vibration to IEC 68-2-6: Operational 5-150 Hz, 2 g
Shock to IEC 68-2-27: Operational 25 g (10 g relay)
Operating and Storage Humidity: 0 to 85% max. RH non-condensing
Altitude: Up to 2000 meters

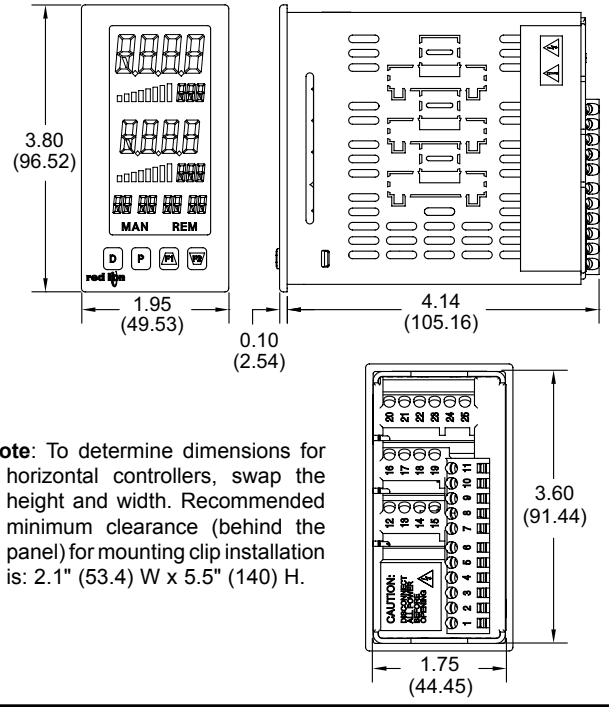
CERTIFICATIONS AND COMPLIANCES:
CE Approved
EN 61326-1 Immunity to Industrial Locations
Emission CISPR 11 Class A
IEC/EN 61010-1
RoHS Compliant
UL Listed: File #E179259
Type 4X Indoor Enclosure rating (Face only)
IP65 Enclosure rating (Face only)
IP20 Enclosure rating (Rear of unit)

CONNECTIONS: High compression cage-clamp terminal block
Wire Strip Length: 0.3" (7.5 mm)
Wire Gauge Capacity: 26 to 16 AWG (0.14 to 1.5 mm^2)
Torque: 4.4-5.3 inch-lbs (0.5-0.6 N-m)

CONSTRUCTION: This controller is rated NEMA 4X/IP65 for indoor use only. IP20 Touch safe. Installation Category II, Pollution Degree 2. One piece bezel/ case. Flame resistant. Synthetic rubber keypad. Panel gasket and mounting clip included.

WEIGHT: 8 oz. (226.8 g)

DIMENSIONS In inches (mm)



Note: To determine dimensions for horizontal controllers, swap the height and width. Recommended minimum clearance (behind the panel) for mounting clip installation is: 2.1" (53.4) W x 5.5" (140) H.

SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in this literature or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired. Do not use this controller to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the controller.

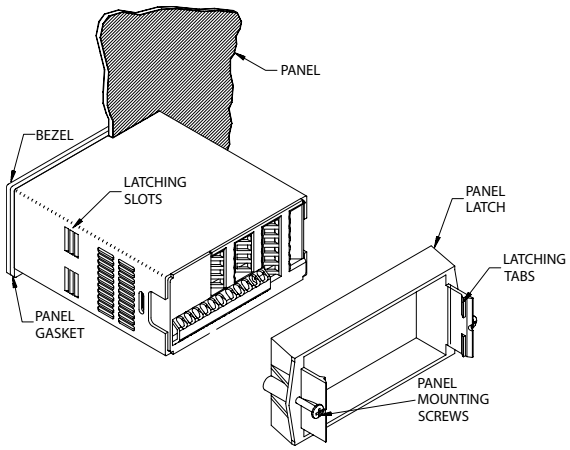
CAUTION: Risk of Danger.
Read complete instructions prior to installation and operation of the unit.

CAUTION:
Risk of electric shock.

CONTROLLER INSTALLATION

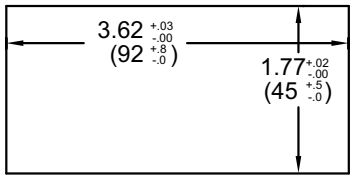
The PAX2C meets NEMA 4X/IP65 requirements when properly installed. The controller is intended to be mounted into an enclosed panel. Prepare the panel cutout to the dimensions shown. Remove the panel latch from the controller. Slide the panel gasket over the rear of the controller to the back of the bezel. The controller should be installed fully assembled. Insert the controller into the panel cutout.

While holding the controller in place, push the panel latch over the rear of the controller so that the tabs of the panel latch engage in the slots on the case. The panel latch should be engaged in the farthest forward slot possible. To achieve a proper seal, tighten the latch screws evenly until the controller is snug in the panel (Torque to approximately 7 in-lbs [79N-cm]). Do not over-tighten the screws.

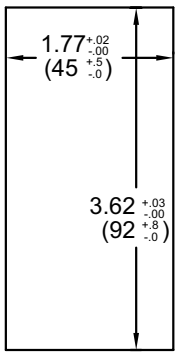


Installation Environment

The controller should be installed in a location that does not exceed the operating temperature and provides good air circulation. Placing the controller near devices that generate excessive heat should be avoided.



HORIZONTAL PANEL CUT-OUT



VERTICAL PANEL CUT-OUT

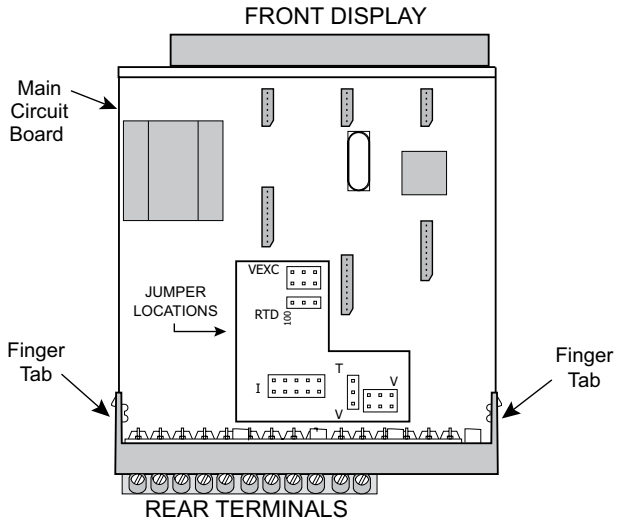
SETTING THE JUMPERS

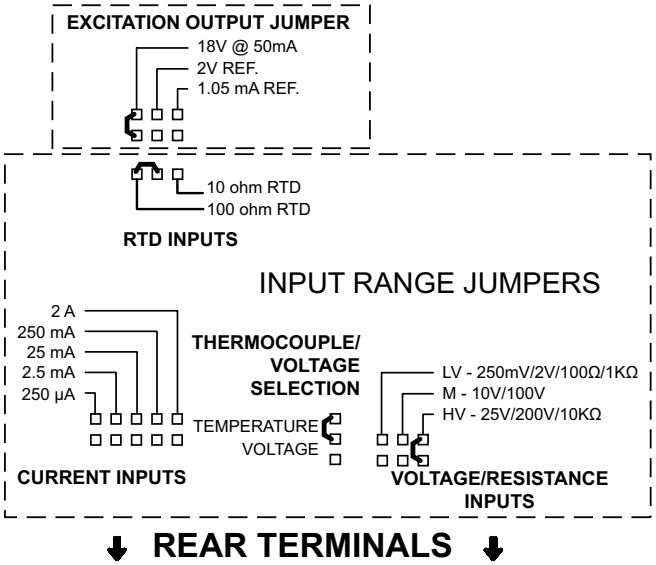
The PAX2C controller has four jumpers that must be checked and/or changed prior to applying power. The following Jumper Selection Figures show an enlargement of the jumper area.

To access the jumpers, remove the controller base from the case by firmly squeezing and pulling back on the side rear finger tabs. This should lower the latch below the case slot (which is located just in front of the finger tabs). It is recommended to release the latch on one side, then start the other side latch.

Warning: Exposed line voltage exists on the circuit boards. Remove all power to the controller and load circuits before accessing inside of the controller.

INPUT RANGE JUMPERS

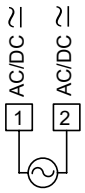




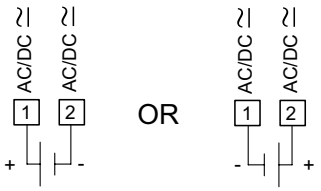
POWER WIRING

The power supplied to the meter shall employ a 15 Amp UL approved circuit breaker for AC input and a 1 Amp, 250 V UL approved fuse for DC input. It shall be easily accessible and marked as a disconnecting device to the installed controller. This device is not directly intended for connection to the mains without a reliable means to reduce transient over-voltages to 1500 V.

AC Power



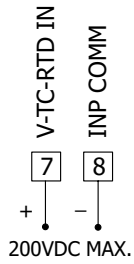
DC Power



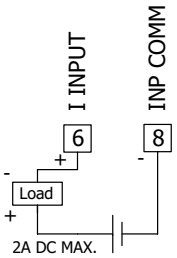
VOLTAGE/RESISTANCE/CURRENT INPUT SIGNAL WIRING

IMPORTANT: Before connecting signal wires, the Input Range Jumpers and Excitation Jumper should be verified for proper position.

Voltage Signal

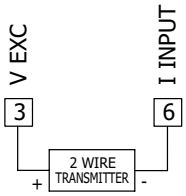


Process/Current Signal (external powered)



Process/Current Signal (2 wire requiring 18V excitation)

Excitation Jumper: 18 V

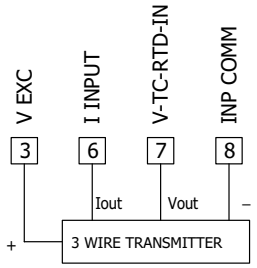


Current Signal (3 wire requiring 18 V excitation)

Terminal 3: +Volt supply
Terminal 6: +ADC (signal)
Terminal 8: -ADC (common)
Excitation Jumper: 18 V

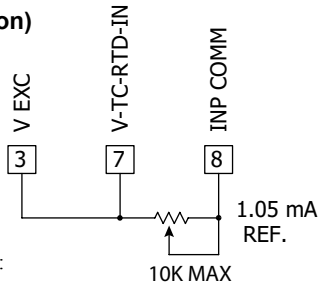
Voltage Signal (3 wire requiring 18 V excitation)

Terminal 3: +Volt supply
Terminal 7: +VDC (signal)
Terminal 8: -VDC (common)
Excitation Jumper: 18 V



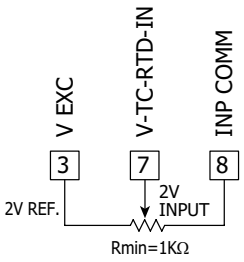
Resistance Signal (2 wire requiring excitation)

Terminal 3: Jumper to terminal 7
Terminal 7: Resistance
Terminal 8: Resistance
Excitation Jumper: 1.05 mA REF.
T/V Jumper: V position
Voltage/Resistance Input Jumper: Set per input signal



Potentiometer Signal as Voltage Input (3 wire requiring excitation)

Terminal 3: High end of pot.
Terminal 7: Wiper
Terminal 8: Low end of pot.
Excitation Jumper: 2 V REF.
T/V Jumper: V
Voltage/Resistance Input Jumper: 2 Volt
Module 1 Input Range: 2 Volt
Note: The Apply signal scaling style should be used because the signal will be in volts.

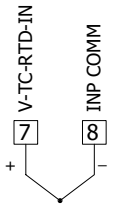


CAUTION: *Sensor input common is NOT isolated from user input common. In order to maintain safe operation of the controller, the sensor input common must be suitably isolated from hazardous live earth referenced voltages; or input common must be at protective earth ground potential. If not, hazardous live voltage may be present at the User Inputs and User Input Common terminals. Appropriate considerations must then be given to the potential of the user input common with respect to earth common; and the common of the isolated option cards with respect to input common.*

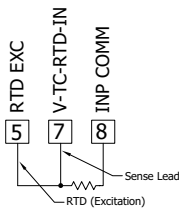
TEMPERATURE INPUT SIGNAL WIRING

IMPORTANT: Before connecting signal wires, verify the T/V Jumper is in the T position.

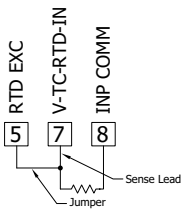
Thermocouple



3-Wire RTD



2-Wire RTD



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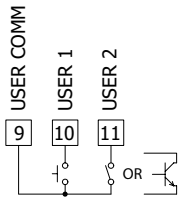
USER INPUT WIRING

If not using User Inputs, then skip this section. User Input terminal does not need to be wired in order to remain in the inactive state.

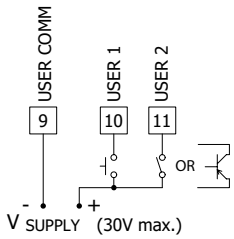
Sinking Logic (UACt Lo)

When the UACt parameter is programmed to Lo, the user inputs of the controller are internally pulled up to +3.3 V with 20 KΩ resistance. The input is active when it is pulled low (<1.1 V).



Sourcing Logic (UACt Hi)

When the UACt parameter is programmed to Hi, the user inputs of the controller are internally pulled down to 0 V with 20 KΩ resistance. The input is active when a voltage greater than 2.2 VDC is applied.



DIGITAL OUTPUT (SETPOINT) WIRING
SERIAL COMMUNICATION WIRING
ANALOG OUTPUT WIRING
FLEXCARD INPUT/OUTPUT WIRING

See appropriate option card bulletin for wiring details.

ORDERING INFORMATION

TYPE	MODEL NO.	DESCRIPTION	PART NUMBER
Controller	PAX2C	Universal Input Temperature/Process Controller, with FlexBus™ Capability, Horizontal	PX2C8H00
		Universal Input Temperature/Process Controller, with FlexBus™ Capability, Vertical	PX2C8V00
		Universal Input Temperature/Process PID Profile Controller, with FlexBus™ Capability, Horizontal	PX2CHZ00
		Universal Input Temperature/Process PID Profile Controller, with FlexBus™ Capability, Vertical	PX2CVR00
Standard Option Cards	**PAXCDS**	Dual Form C Relay Digital Output Card	PAXCDS10
		Quad Form A Relay Digital Output Card	PAXCDS20
		Quad Sinking Open Collector Digital Output Card	PAXCDS30
		Quad Sourcing Open Collector Digital Output Card	PAXCDS40
		Dual Triac/Dual SSR Drive Digital Output Card	PAXCDS50
		Quad Form C Relay Digital Output Card	PAXCDS60 *
	PAXCDC	RS485 Serial Communications Card with Terminal Block	PAXCDC10
		Extended RS485 Serial Communications Card with Dual RJ11 Connector	PAXCDC1C
		RS232 Serial Communications Card with Terminal Block	PAXCDC20
		Extended RS232 Serial Communications Card with 9 Pin D Connector	PAXCDC2C
		DeviceNet Communications Card	PAXCDC30
		Profibus-DP Communications Card	PAXCDC50
	PAXCDL	Analog Output Card	PAXCDL10
FlexBus™ Option Cards	**PX2FCA**	Process Input/Remote Setpoint/PID Card with Digital Outputs	PX2FCA00 *
		Heater Current Monitor Input Card, With Digital Outputs	PX2FCA10 *
Accessory	**CBLUSB**	USB Programming Cable Type A-Mini B	CBLUSB01
	RCPX2	Horizontal Replacement Case with knock-out features (No labels)	RCPX2H00
		Vertical Replacement Case with knock-out features (No labels)	RCPX2V00

Note: For Modbus communications use an RS485 Communications Output Card and configure communication (tYPE) parameter for Modbus.

* This card is not suitable for use in older PAX2C models. For proper installation, 3 case knock-out features must be present on the top case surface (horizontal controller) or right case surface (vertical controller). To update a case to include these knock-outs, a replacement case is available. RCPX2H00 = Horizontal replacement case, RCPX2V00 = Vertical replacement case.